APPENDIX B

STORMWATER AND STABILITY ENGINEERING CALCULATIONS

1.0 SURFACE WATER RUN-ON AND RUN-OFF CONTROLS

Surface water run-on and run-off from precipitation events will be managed as required by *Health Regulation #1, Solid Waste Management and Permitting* (SLC Board of Health, 1989). Specific requirements for surface water control are provided in Section 6.5.t. The surface water structures, including the ditch and retention pond, were sized to control run-on/run-off resulting from a 25-yr, 24-hr storm event (2.5 inches). See the Construction Plans/Specifications and attached engineering calculations for details.

1.1 Control of Surface Water During Construction

During construction, controls will be implemented to minimize run-off of surface water from active (waste placement) areas. This may include sloping the waste surface to prevent run-off from the active face or constructing berms (12" high) at the edges of the landfill cell to prevent run-off from active areas.

Run-on to the proposed cell will be diverted from the active area by the construction of a perimeter drainage ditch (see Figure 4 of the Closure Plans). The ditch will divert water from the up-gradient drainage areas around the cell to the retention pond located north of the proposed cell. The proposed ditch is 12" deep with 3:1 (horizontal:vertical) side slopes. Temporary culverts may replace short sections of the ditch in order to facilitate waste movement.

Riprap will be placed in the perimeter ditch were slopes exceed 10% and water velocities could cause erosion. In areas where riprap will not be placed (slopes flatter than 10%), temporary erosion control blankets will be installed to prevent erosion until the establishment of vegetation.

1.2 Control of Surface Water After Closure

After the landfill cell has been closed with the construction of the final cover, it will be revegetated to minimize erosion and enhance evapotranspiration. Any temporary culverts will be removed and the perimeter ditch constructed as outlined in the plans and specifications.

The perimeter ditch is sized to transfer all run-off from the closed landfill and surrounding area to the retention pond. The retention pond is sized to store all run-off from a 25-yr, 24-hr precipitation event. The perimeter ditch and retention basin is designed to collect and retain run-off from the landfill cell area only, future modifications to the surface water controls may be made during site development.

KLEINFELDER

SHEET____ OF____

PROJECT UDOT Taylorsville Landfill PROJECT NO. 21770.001

SUBJECT Stormwater BY R. Blake DATE 12-2-02

REVIEWED BY____ DATE____

Purpose: Size stormwater structures to convey 25-yr, 24-hr precipitation event.

Given
- 25-yr, 24-hr storm is 2.5" (NOAA Atlas 2, Vol. VI Figure 28, 1973)
- Apply precipitation using SCS, Type 2 method
- Runoff Curve Number (CN) = 85 (Viessman, 1989) assuming worst case (barren ground).

Determine Max Q

Input given parameters (above) into StormShed program. Input / Output is attached.
Assume contributing area is 8 acres including cap and small area between cap and 3200 West.
For 8 acre are → Q_{max} = 4.9 cfs, say **5 cfs**

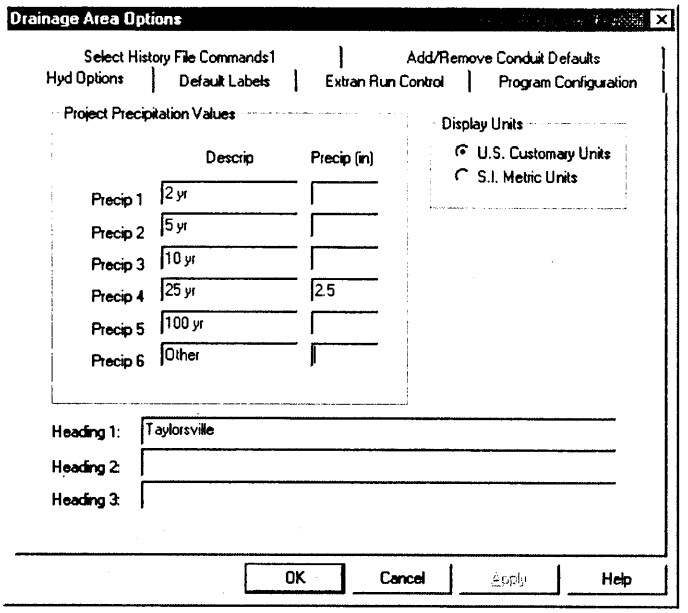
Determine Channel Size

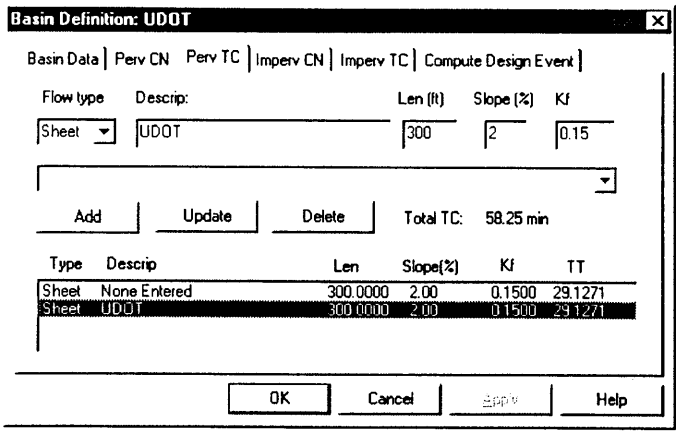
Based on Q = 5 cfs, triangular channel, Manning n = 0.03, 3:1 side slopes, and min slope = 1%

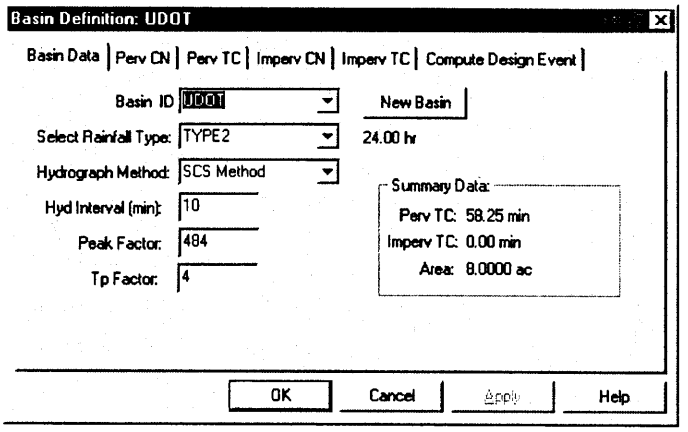
Channel is 12" deep w/ 3:1 side slopes

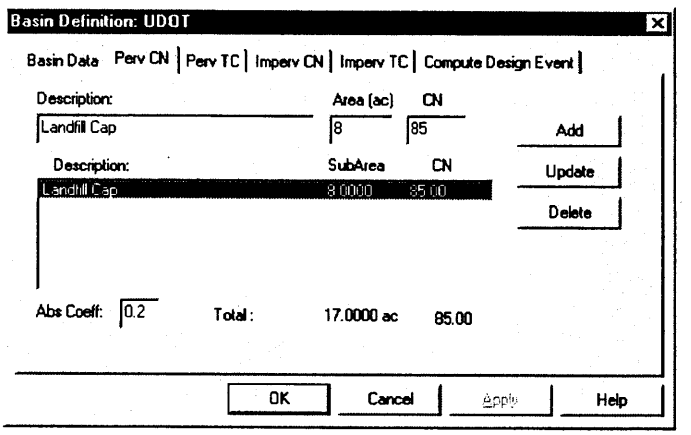
* See attached Flow Master output

Input Parameters for STORMSHED Program





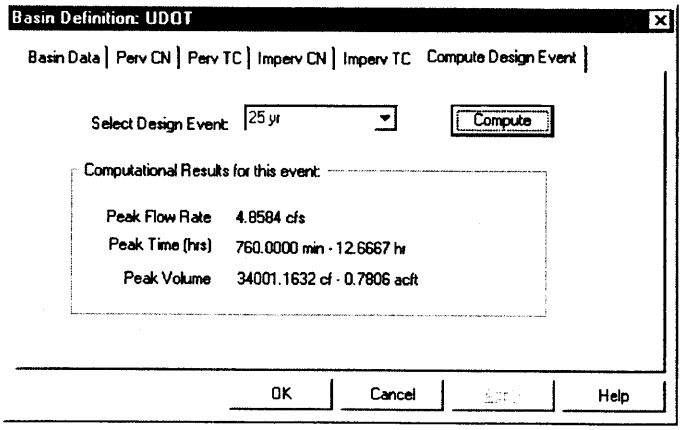




Output (8 acres)

Maximum Q = 4.9 cfs

Total V = 0.8 acre-ft



4.9 cfs

Triangular Channel Analysis & Design

Open Channel - Uniform flow

Worksheet Name: **UDOT Landfill**

Description: Q = 5 cfs, slope = 1.0%

Solve For Depth

Given Constant Data;

Z-Left..... 3.00

Z-Right..... 3.00

Mannings 'n'..... 0.030

Channel Discharge.. 5.00

VARIABLE COMPUTED COMPUTED

Minimum of 0.80' deep

Z-Left (H:V)	Z-Right (H:V)	Mannings 'n'	Channel Slope ft/ft	Channel Depth ft	Channel Discharge cfs	Velocity (fps)
3.00	3.00	0.030	0.0100	**0.80**	5.00	2.60
3.00	3.00	0.030	0.0300	0.65	5.00	3.92
3.00	3.00	0.030	0.0500	0.59	5.00	4.75
3.00	3.00	0.030	0.0700	0.56	5.00	5.39
3.00	3.00	0.030	0.0900	0.53	5.00	**5.92**
3.00	3.00	0.030	0.1100	0.51	5.00	6.39
3.00	3.00	0.030	0.1300	0.50	5.00	6.80

Open Channel Flow Module, Version 3.11 (c)

Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

2.0 SLOPE STABILITY

Slope stability analysis of the final landfill cover was performed to verify that it was stable in both static and pseudo-static (seismic) conditions. The stability of the proposed slopes for the Taylorsville landfill cap construction was performed using a computerized slope-stability program (STABLE 5M).

2.1 Program Input

For the pseudo-static condition a value equal to two-thirds of the peak ground acceleration (0.25g) for 10% probability of exceedance in 50 years was used. Potential failure surfaces were modeled as a deep-seated circular failure using the Bishop's method and a shallower slip-surface along the GCL liner/soil interface using a specified surface analysis. Groundwater was conservatively modeled at approximately 5 feet below the toe of the slope and sloping up through the waste. Actual groundwater depths are well below any failure surface. Maximum side slopes were 3:1 (horizontal:vertical).

2.2 Results

Stability analyses indicates that the proposed landfill slopes are globally stable, with a minimum factor of safety of 1.8 in the static condition and 1.1 in the pseudo-static condition. Commonly accepted factor of safety values are 1.5 for static conditions and 1.1 for seismic conditions.

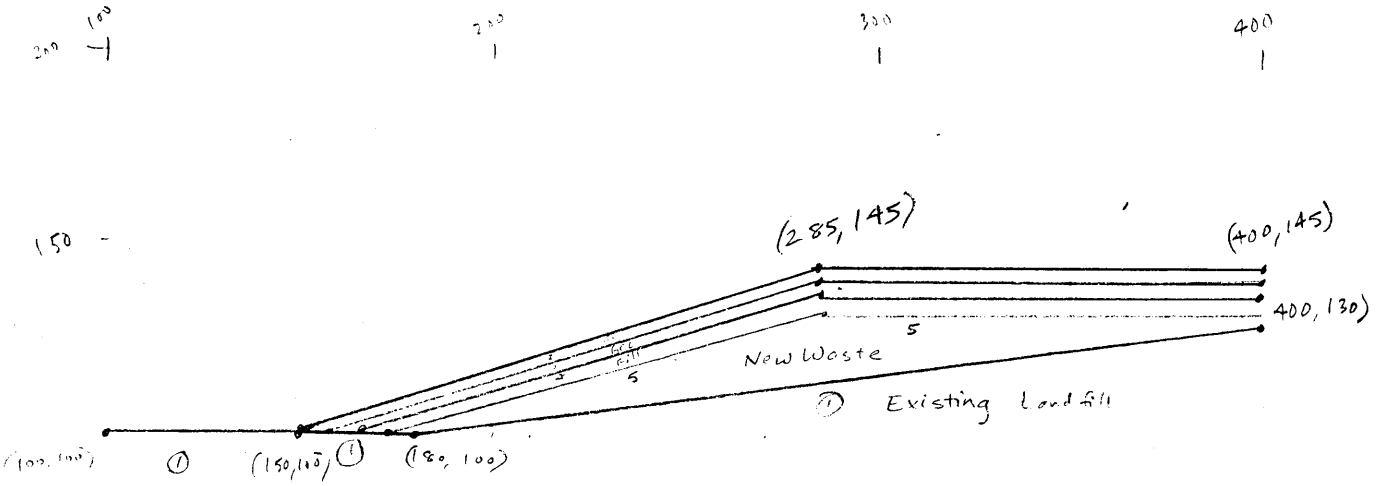
KLEINFELDER

SHEET____ OF____

PROJECT Taylorsville Landfill Cap PROJECT NO. 21770

SUBJECT Cap / GCL Stability BY VM DATE 11/12/02

Section B REVIEWED BY DW DATE 12/1/02



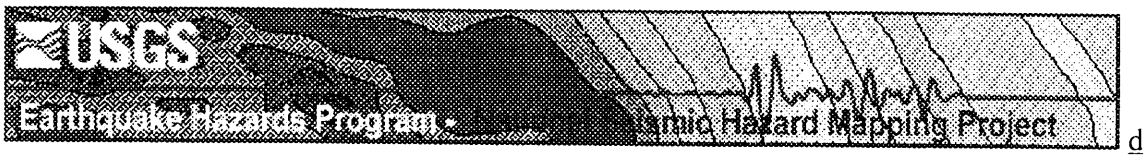
Soil	①	Existing Waste	$\phi \approx 25°$	$c = 100$ psf
Soil	②	12" Select Fill	$\phi \approx 36°$	$c = 0$
Soil	③	GCL	$\phi = 33°$	$c = 40$ psf
Soil	④	12" Subbase	$\phi = 36°$	$c = 0$
Soil	⑤	New Waste	$\phi \approx 25°$	$c = 100$ psf

F.S. General $\approx$ 1.8 (1.13 seismic)

F.S. GCL $\approx$ 2.2 (1.4 seismic)

PGA = 0.25 g

2/3 PGA = 0.17 g



d

The input zip-code is 84118.

ZIP CODE	84118	
LOCATION	40.6529 Lat.	-111.9842 Long.
DISTANCE TO NEAREST GRID POINT	5.3961 kms	
NEAREST GRID POINT	40.7 Lat.	-112.0 Long.

Probabilistic ground motion values, in %g, at the Nearest Grid point are:

	10%PE in 50 yr	5%PE in 50 yr	2%PE in 50 yr
PGA	25.379450	36.948849	52.802071
0.2 sec SA	58.278530	95.574280	125.960999
0.3 sec SA	53.719200	88.444679	123.147301
1.0 sec SA	19.365530	30.874531	47.864449

- -

The input zip-code is .
Zip code is zero and we go to the end and stop.

PROJECT INFO: Home Page
SEISMIC HAZARD: Hazard by Zip Code

$\frac{2}{3}$ of PGA = 0.17 g

** PCSTABL5M **

by
Purdue University

General Stability
F.S. ≈ 1.8

1

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date:	11-12-02
Time of Run:	9:09am
Run By:	Nigel Miller
Input Data Filename:	D:TAYLOR2
Output Filename:	D:TAYLOR2.OUT
Plotted Output Filename:	D:TAYLOR2.PLT

PROBLEM DESCRIPTION Taylorsville Landfill Cap
6200 South 3200 West

BOUNDARY COORDINATES

3 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	10.00	10.00	60.00	10.00	1
2	60.00	10.00	195.00	55.00	2
3	195.00	55.00	310.00	55.00	2
4	61.00	10.00	195.00	54.00	3
5	195.00	54.00	310.00	54.00	3
6	61.10	10.00	195.00	53.90	4
7	195.00	53.90	310.00	53.90	4
8	62.10	10.00	195.00	52.90	5
9	195.00	52.90	310.00	52.90	5
10	60.00	10.00	90.00	10.00	1
11	90.00	10.00	310.00	40.00	1

1

ISOTROPIC SOIL PARAMETERS

5 Type(s) of Soil

Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.

Type No.	Unit Wt. (pcf)	Unit Wt. (pcf)	Intercept (psf)	Angle (deg)	Pressure Param.	Constant (psf)	Surface No.
1	110.0	120.0	100.0	25.0	.00	.0	1
2	125.0	130.0	.0	36.0	.00	.0	1
3	120.0	125.0	40.0	33.0	.00	.0	1
4	125.0	130.0	.0	36.0	.00	.0	1
5	115.0	125.0	100.0	25.0	.00	.0	1

1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 3 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	10.00	5.00
2	90.00	5.00
3	310.00	35.00

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 50.00 ft.
and X = 60.00 ft.

Each Surface Terminates Between X = 195.00 ft.
and X = 210.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 1.00 ft.

11.00 ft. Line Segments Define Each Trial Failure Surface.

1

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical

First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.00	10.00
2	60.46	6.61
3	71.17	4.08
4	82.05	2.45
5	93.03	1.73
6	104.02	1.90
7	114.97	2.99
8	125.79	4.97
9	136.41	7.84
10	146.76	11.57
11	156.76	16.14
12	166.36	21.53
13	175.47	27.68
14	184.05	34.56
15	192.04	42.13
16	199.37	50.33
17	202.90	55.00

Circle Center At X = 96.4 ; Y = 135.1 and Radius, 133.4

*** 1.787 ***

Individual data on the 28 slices

Slice No.	Width Ft(m)	Weight Lbs(kg)	Water Force Top Lbs(kg)	Water Force Bot Lbs(kg)	Tie Force Norm Lbs(kg)	Tie Force Tan Lbs(kg)	Earthquake Force Hor Lbs(kg)	Earthquake Force Ver Lbs(kg)	Surcharge Load Lbs(kg)
1	10.0	1784.3	.0	.0	.0	.0	.0	.0	.0
2	.5	173.8	.0	.0	.0	.0	.0	.0	.0
3	.5	220.4	.0	.0	.0	.0	.0	.0	.0
4	.1	43.2	.0	.0	.0	.0	.0	.0	.0
5	1.0	469.3	.0	.0	.0	.0	.0	.0	.0
6	5.2	3470.9	.0	.0	.0	.0	.0	.0	.0
7	3.9	3757.4	.0	114.1	.0	.0	.0	.0	.0
8	10.9	15259.7	.0	1188.0	.0	.0	.0	.0	.0
9	8.0	15058.9	.0	1396.9	.0	.0	.0	.0	.0
10	3.0	6502.4	.0	633.6	.0	.0	.0	.0	.0
11	11.0	26670.7	.0	2956.6	.0	.0	.0	.0	.0

12	10.9	30412.4	.0	3544.8	.0	.0	.0	.0	.0
13	10.8	32676.0	.0	3511.2	.0	.0	.0	.0	.0
14	10.6	33435.4	.0	2856.1	.0	.0	.0	.0	.0
15	10.3	32725.4	.0	1583.9	.0	.0	.0	.0	.0
16	3.6	11335.9	.0	144.6	.0	.0	.0	.0	.0
17	6.4	19369.3	.0	.0	.0	.0	.0	.0	.0
18	7.0	20361.0	.0	.0	.0	.0	.0	.0	.0
19	2.6	7352.9	.0	.0	.0	.0	.0	.0	.0
20	9.1	23618.9	.0	.0	.0	.0	.0	.0	.0
21	8.6	18711.3	.0	.0	.0	.0	.0	.0	.0
22	8.0	13317.9	.0	.0	.0	.0	.0	.0	.0
23	3.0	3713.6	.0	.0	.0	.0	.0	.0	.0
24	4.4	3662.5	.0	.0	.0	.0	.0	.0	.0
25	1.9	795.6	.0	.0	.0	.0	.0	.0	.0
26	.8	150.8	.0	.0	.0	.0	.0	.0	.0
27	.1	9.9	.0	.0	.0	.0	.0	.0	.0
28	.8	47.2	.0	.0	.0	.0	.0	.0	.0

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.00	10.00
2	70.98	9.37
3	81.98	9.34
4	92.97	9.91
5	103.90	11.08
6	114.76	12.85
7	125.51	15.21
8	136.11	18.15
9	146.53	21.67
10	156.74	25.75
11	166.72	30.39
12	176.43	35.56
13	185.84	41.26
14	194.92	47.46
15	203.65	54.15
16	204.65	55.00

Circle Center At X = 77.0 ; Y = 210.2 and Radius, 200.9

*** 1.788 ***

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Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.00	10.00

2	60.51	6.77
3	71.25	4.38
4	82.15	2.87
5	93.13	2.24
6	104.13	2.48
7	115.07	3.61
8	125.89	5.61
9	136.51	8.48
10	146.86	12.18
11	156.89	16.70
12	166.52	22.02
13	175.70	28.08
14	184.36	34.87
15	192.45	42.32
16	199.91	50.40
17	203.52	55.00

Circle Center At X = 95.5 ; Y = 139.3 and Radius, 137.1

*** 1.790 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.11	10.00
2	61.63	6.77
3	72.37	4.41
4	83.27	2.94
5	94.26	2.37
6	105.25	2.70
7	116.18	3.94
8	126.98	6.06
9	137.56	9.07
10	147.86	12.93
11	157.81	17.62
12	167.34	23.12
13	176.38	29.37
14	184.89	36.35
15	192.79	44.00
16	200.04	52.28
17	202.05	55.00

Circle Center At X = 95.7 ; Y = 136.4 and Radius, 134.0

*** 1.791 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.11	10.00
2	61.58	6.61
3	72.29	4.13
4	83.18	2.58
5	94.17	1.96
6	105.16	2.28
7	116.09	3.55
8	126.87	5.74
9	137.42	8.85
10	147.66	12.86
11	157.53	17.72
12	166.94	23.41
13	175.84	29.89
14	184.14	37.10
15	191.80	44.99
16	198.75	53.52
17	199.77	55.00

Circle Center At X = 95.9 ; Y = 130.4 and Radius, 128.4

*** 1.791 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.11	10.00
2	61.50	6.39
3	72.17	3.71
4	83.04	2.00
5	94.01	1.27
6	105.01	1.52
7	115.94	2.75
8	126.72	4.95
9	137.26	8.11
10	147.47	12.19
11	157.28	17.17
12	166.61	23.00
13	175.37	29.65
14	183.51	37.05
15	190.96	45.14
16	197.65	53.87
17	198.37	55.00

Circle Center At X = 96.7 ; Y = 124.4 and Radius, 123.1

*** 1.792 ***

1

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	56.67	10.00
2	67.61	8.85
3	78.60	8.36
4	89.60	8.51
5	100.57	9.31
6	111.47	10.75
7	122.27	12.84
8	132.93	15.56
9	143.41	18.90
10	153.67	22.86
11	163.69	27.41
12	173.41	32.55
13	182.82	38.25
14	191.87	44.50
15	200.54	51.27
16	204.78	55.00

Circle Center At X = 81.6 ; Y = 194.3 and Radius, 186.0

*** 1.792 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	52.22	10.00
2	63.14	8.66
3	74.12	8.00
4	85.12	7.99
5	96.10	8.66
6	107.02	9.99
7	117.84	11.99
8	128.51	14.64
9	139.01	17.93
10	149.29	21.85
11	159.31	26.39

12	169.03	31.53
13	178.43	37.25
14	187.46	43.53
15	196.09	50.35
16	201.29	55.00

Circle Center At X = 79.7 ; Y = 188.5 and Radius, 180.6

*** 1.792 ***

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Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	57.78	10.00
2	68.70	8.68
3	79.68	8.10
4	90.68	8.28
5	101.64	9.21
6	112.51	10.88
7	123.25	13.30
8	133.79	16.44
9	144.09	20.30
10	154.10	24.85
11	163.78	30.07
12	173.08	35.95
13	181.96	42.45
14	190.37	49.53
15	196.02	55.00

Circle Center At X = 82.6 ; Y = 168.9 and Radius, 160.8

*** 1.794 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	53.33	10.00
2	63.70	6.31
3	74.35	3.57
4	85.21	1.82
5	96.18	1.06
6	107.18	1.30

7	118.11	2.55
8	128.88	4.78
9	139.40	7.98
10	149.59	12.13
11	159.36	17.19
12	168.63	23.12
13	177.31	29.87
14	185.35	37.37
15	192.67	45.58
16	199.22	54.43
17	199.57	55.00

Circle Center At X = 99.0 ; Y = 121.8 and Radius, 120.7

*** 1.794 ***

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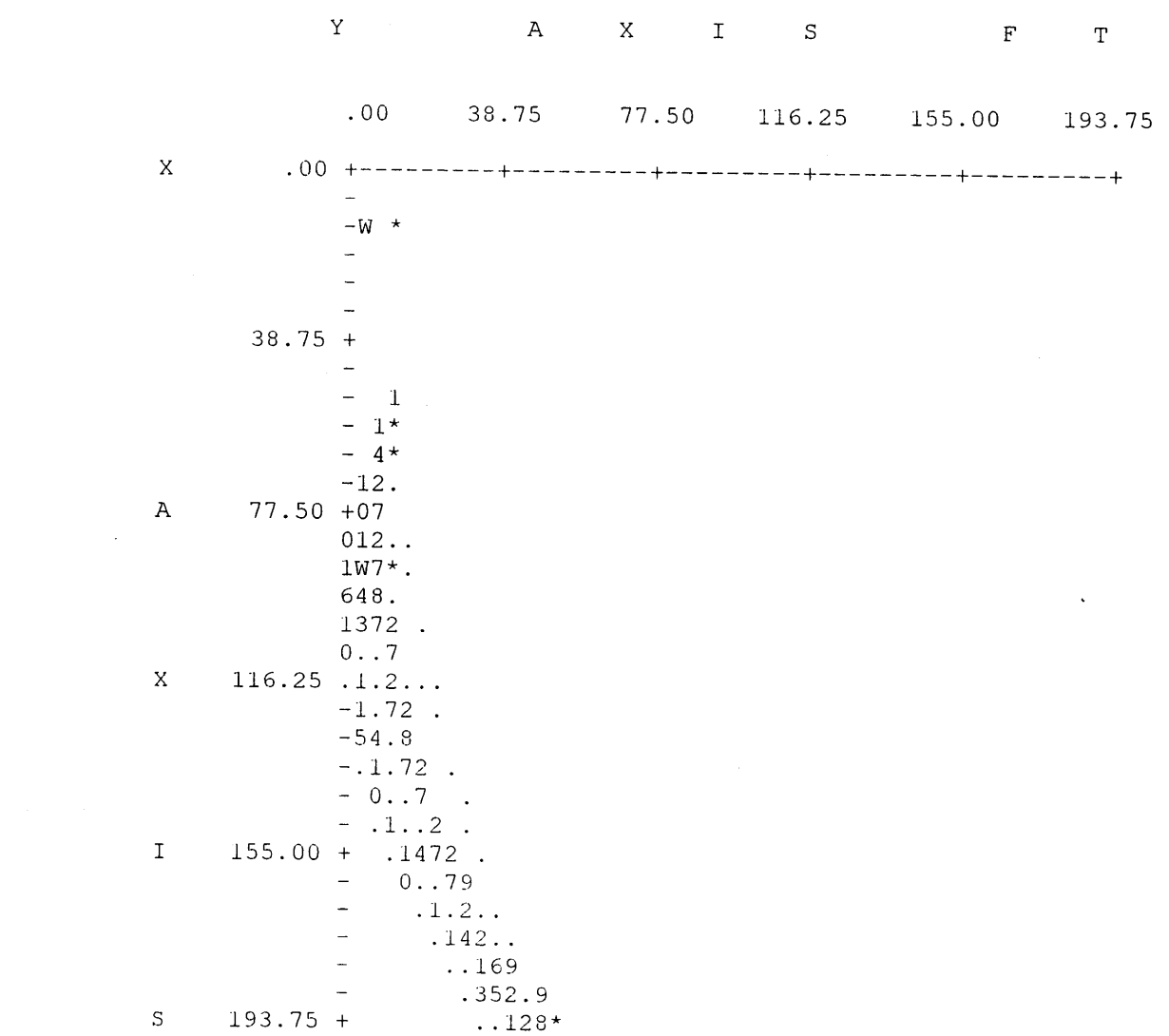

```
                  -            ..11
                  -             ..2
                  -               .
                  -
                  -
          232.50  +
                  -
                  -
                  -
                  -
                  -
                  -
F         271.25  +
                  -
                  -
                  -
                  -
                  -
T         310.00  +          W*    *
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** PCSTABL5M **

by
Purdue University

1

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

General Seismic
F.S. ≈ 1.13

Run Date:	11-14-02
Time of Run:	3:11pm
Run By:	Nigel Miller
Input Data Filename:	D:TAYLOR2E
Output Filename:	D:TAYLOR2E.OUT
Plotted Output Filename:	D:TAYLOR2E.PLT

PROBLEM DESCRIPTION Taylorsville Landfill Cap
6200 South 3200 West

BOUNDARY COORDINATES

3 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	10.00	10.00	60.00	10.00	1
2	60.00	10.00	195.00	55.00	2
3	195.00	55.00	310.00	55.00	2
4	61.00	10.00	195.00	54.00	3
5	195.00	54.00	310.00	54.00	3
6	61.10	10.00	195.00	53.90	4
7	195.00	53.90	310.00	53.90	4
8	62.10	10.00	195.00	52.90	5
9	195.00	52.90	310.00	52.90	5
10	60.00	10.00	90.00	10.00	1
11	90.00	10.00	310.00	40.00	1

1

ISOTROPIC SOIL PARAMETERS

5 Type(s) of Soil

Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.

Type No.	Unit Wt. (pcf)	Unit Wt. (pcf)	Intercept (psf)	Angle (deg)	Pressure Param.	Constant (psf)	Surface No.
1	110.0	120.0	100.0	25.0	.00	.0	1
2	125.0	130.0	.0	36.0	.00	.0	1
3	120.0	125.0	40.0	33.0	.00	.0	1
4	125.0	130.0	.0	36.0	.00	.0	1
5	115.0	125.0	100.0	25.0	.00	.0	1

1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 3 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	10.00	5.00
2	90.00	5.00
3	310.00	35.00

A Horizontal Earthquake Loading Coefficient
Of .170 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of .000 Has Been Assigned

Cavitation Pressure = .0 psf

1

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 50.00 ft.
and X = 60.00 ft.

Each Surface Terminates Between X = 195.00 ft.
and X = 210.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation

At Which A Surface Extends Is Y = 1.00 ft.

11.00 ft. Line Segments Define Each Trial Failure Surface.

1

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.00	10.00
2	70.98	9.37
3	81.98	9.34
4	92.97	9.91
5	103.90	11.08
6	114.76	12.85
7	125.51	15.21
8	136.11	18.15
9	146.53	21.67
10	156.74	25.75
11	166.72	30.39
12	176.43	35.56
13	185.84	41.26
14	194.92	47.46
15	203.65	54.15
16	204.65	55.00

Circle Center At X = 77.0 ; Y = 210.2 and Radius, 200.9

*** 1.128 ***

Individual data on the 25 slices

Slice No.	Width Ft(m)	Weight Lbs(kg)	Water Force Top Lbs(kg)	Water Force Bot Lbs(kg)	Tie Force Norm Lbs(kg)	Tie Force Tan Lbs(kg)	Earthquake Force Hor Lbs(kg)	Earthquake Force Ver Lbs(kg)	Surcharge Load Lbs(kg)
1	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	1.0	24.0	.0	.0	.0	.0	4.1	.0	.0

3	.1	5.0	.0	.0	.0	.0	.9	.0	.0
4	1.0	76.6	.0	.0	.0	.0	13.0	.0	.0
5	8.9	2658.6	.0	.0	.0	.0	452.0	.0	.0
6	11.0	7821.5	.0	.0	.0	.0	1329.7	.0	.0
7	8.0	8459.9	.0	.0	.0	.0	1438.2	.0	.0
8	3.0	3661.2	.0	.0	.0	.0	622.4	.0	.0
9	10.9	15567.4	.0	.0	.0	.0	2646.5	.0	.0
10	10.9	18164.1	.0	.0	.0	.0	3087.9	.0	.0
11	6.3	11479.7	.0	.0	.0	.0	1951.5	.0	.0
12	4.4	8433.9	.0	.0	.0	.0	1433.8	.0	.0
13	10.6	20769.5	.0	.0	.0	.0	3530.8	.0	.0
14	10.4	20762.3	.0	.0	.0	.0	3529.6	.0	.0
15	10.2	19935.8	.0	.0	.0	.0	3389.1	.0	.0
16	10.0	18341.5	.0	.0	.0	.0	3118.1	.0	.0
17	9.7	16046.4	.0	.0	.0	.0	2727.9	.0	.0
18	9.4	13131.7	.0	.0	.0	.0	2232.4	.0	.0
19	9.1	9692.0	.0	.0	.0	.0	1647.6	.0	.0
20	.1	69.0	.0	.0	.0	.0	11.7	.0	.0
21	7.0	4015.2	.0	.0	.0	.0	682.6	.0	.0
22	1.3	260.5	.0	.0	.0	.0	44.3	.0	.0
23	.1	17.1	.0	.0	.0	.0	2.9	.0	.0
24	.2	22.2	.0	.0	.0	.0	3.8	.0	.0
25	1.0	53.1	.0	.0	.0	.0	9.0	.0	.0

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.00	10.00
2	60.46	6.61
3	71.17	4.08
4	82.05	2.45
5	93.03	1.73
6	104.02	1.90
7	114.97	2.99
8	125.79	4.97
9	136.41	7.84
10	146.76	11.57
11	156.76	16.14
12	166.36	21.53
13	175.47	27.68
14	184.05	34.56
15	192.04	42.13
16	199.37	50.33
17	202.90	55.00

Circle Center At X = 96.4 ; Y = 135.1 and Radius, 133.4

*** 1.132 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	56.67	10.00
2	67.61	8.85
3	78.60	8.36
4	89.60	8.51
5	100.57	9.31
6	111.47	10.75
7	122.27	12.84
8	132.93	15.56
9	143.41	18.90
10	153.67	22.86
11	163.69	27.41
12	173.41	32.55
13	182.82	38.25
14	191.87	44.50
15	200.54	51.27
16	204.78	55.00

Circle Center At X = 81.6 ; Y = 194.3 and Radius, 186.0

*** 1.132 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.00	10.00
2	71.00	9.93
3	81.99	10.36
4	92.95	11.28
5	103.86	12.69
6	114.70	14.60
7	125.43	16.99
8	136.05	19.86
9	146.53	23.21
10	156.84	27.03
11	166.98	31.31
12	176.91	36.05
13	186.61	41.22
14	196.07	46.83
15	205.27	52.86
16	208.24	55.00

Circle Center At X = 67.1 ; Y = 253.2 and Radius, 243.3

*** 1.133 ***

1

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.00	10.00
2	60.51	6.77
3	71.25	4.38
4	82.15	2.87
5	93.13	2.24
6	104.13	2.48
7	115.07	3.61
8	125.89	5.61
9	136.51	8.48
10	146.86	12.18
11	156.89	16.70
12	166.52	22.02
13	175.70	28.08
14	184.36	34.87
15	192.45	42.32
16	199.91	50.40
17	203.52	55.00

Circle Center At X = 95.5 ; Y = 139.3 and Radius, 137.1

*** 1.133 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	52.22	10.00
2	62.75	6.83
3	73.50	4.47
4	84.39	2.94
5	95.37	2.26
6	106.37	2.42
7	117.32	3.42
8	128.17	5.26
9	138.84	7.93
10	149.28	11.41
11	159.41	15.68
12	169.19	20.72
13	178.56	26.49

14	187.45	32.96
15	195.82	40.10
16	203.62	47.86
17	209.77	55.00

Circle Center At X = 98.8 ; Y = 145.4 and Radius, 143.2

*** 1.134 ***

1

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	58.89	10.00
2	69.83	8.89
3	80.82	8.42
4	91.82	8.57
5	102.79	9.37
6	113.70	10.79
7	124.51	12.84
8	135.18	15.50
9	145.68	18.78
10	155.97	22.66
11	166.03	27.12
12	175.81	32.16
13	185.28	37.75
14	194.42	43.88
15	203.18	50.52
16	208.44	55.00

Circle Center At X = 83.6 ; Y = 198.8 and Radius, 190.5

*** 1.134 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	56.67	10.00
2	67.60	8.80
3	78.59	8.23
4	89.59	8.30
5	100.56	9.01
6	111.48	10.35

7	122.30	12.33
8	132.99	14.93
9	143.51	18.15
10	153.82	21.97
11	163.90	26.39
12	173.70	31.38
13	183.20	36.93
14	192.36	43.02
15	201.14	49.64
16	207.47	55.00

Circle Center At X = 82.9 ; Y = 197.3 and Radius, 189.2

*** 1.134 ***

1

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.00	10.00
2	60.59	7.04
3	71.38	4.86
4	82.29	3.49
5	93.28	2.92
6	104.27	3.16
7	115.22	4.20
8	126.07	6.05
9	136.75	8.69
10	147.20	12.10
11	157.38	16.28
12	167.22	21.19
13	176.68	26.81
14	185.70	33.11
15	194.22	40.05
16	202.22	47.61
17	208.97	55.00

Circle Center At X = 95.5 ; Y = 152.5 and Radius, 149.6

*** 1.134 ***

Failure Surface Specified By 17 Coordinate Points

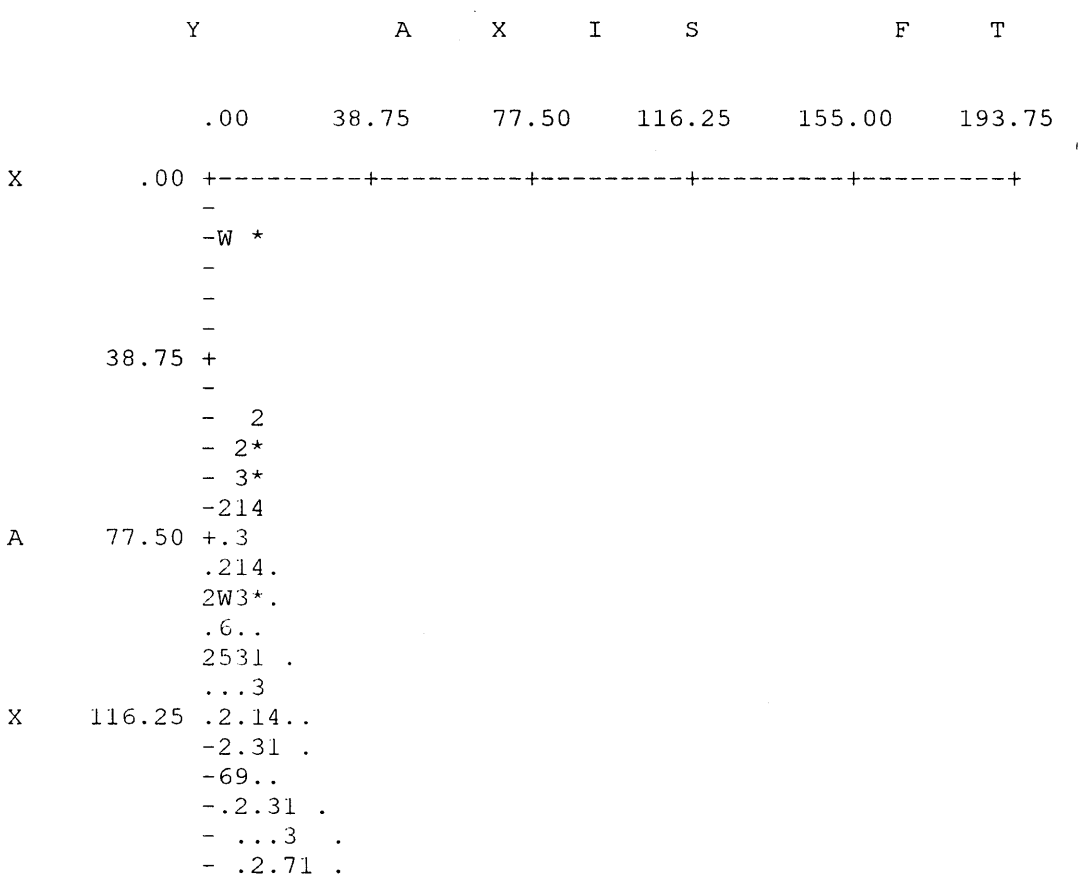
Point No.	X-Surf (ft)	Y-Surf (ft)

1	51.11	10.00
2	61.69	6.99
3	72.47	4.78
4	83.38	3.37
5	94.36	2.78
6	105.36	3.01
7	116.31	4.05
8	127.15	5.90
9	137.83	8.55
10	148.28	11.99
11	158.44	16.20
12	168.27	21.14
13	177.70	26.81
14	186.68	33.16
15	195.17	40.16
16	203.11	47.76
17	209.62	55.00

Circle Center At X = 96.8 ; Y = 150.8 and Radius, 148.0

*** 1.135 ***

1



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T     310.00 +         W*    *
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** PCSTABL5M **

by
Purdue University

1

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

GCL Stability
F.S. ≈ 2.2

Run Date:	11-12-02
Time of Run:	9:06am
Run By:	Nigel Miller
Input Data Filename:	D:TAYLOR1
Output Filename:	D:TAYLOR1.OUT
Plotted Output Filename:	D:TAYLOR1.PLT

PROBLEM DESCRIPTION Taylorsville Landfill Cap
6200 South 3200 West

BOUNDARY COORDINATES

3 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	10.00	10.00	60.00	10.00	1
2	60.00	10.00	195.00	55.00	2
3	195.00	55.00	310.00	55.00	2
4	61.00	10.00	195.00	54.00	3
5	195.00	54.00	310.00	54.00	3
6	61.10	10.00	195.00	53.90	4
7	195.00	53.90	310.00	53.90	4
8	62.10	10.00	195.00	52.90	5
9	195.00	52.90	310.00	52.90	5
10	60.00	10.00	90.00	10.00	1
11	90.00	10.00	310.00	40.00	1

1

ISOTROPIC SOIL PARAMETERS

5 Type(s) of Soil

Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.

Type No.	Unit Wt. (pcf)	Unit Wt. (pcf)	Intercept (psf)	Angle (deg)	Pressure Param.	Constant (psf)	Surface No.
1	110.0	120.0	100.0	25.0	.00	.0	1
2	125.0	130.0	.0	36.0	.00	.0	1
3	120.0	125.0	40.0	33.0	.00	.0	1
4	125.0	130.0	.0	36.0	.00	.0	1
5	115.0	125.0	100.0	25.0	.00	.0	1

1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 3 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	10.00	5.00
2	90.00	5.00
3	310.00	35.00

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

10 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 11.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	61.00	10.00	62.00	10.00	.50
2	195.00	54.00	196.00	54.00	.50

1

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Janbu Method * *

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.43	10.48
2	61.82	10.08
3	195.94	54.14
4	196.38	55.00

*** 2.215 ***

Individual data on the 8 slices

Slice No.	Width Ft(m)	Weight Lbs(kg)	Water Force Top Lbs(kg)	Water Force Bot Lbs(kg)	Tie Force Norm Lbs(kg)	Tie Force Tan Lbs(kg)	Earthquake Force Hor Lbs(kg)	Earthquake Force Ver Lbs(kg)	Surcharge Load Lbs(kg)
1	.3	5.3	.0	.0	.0	.0	.0	.0	.0
2	.0	1.1	.0	.0	.0	.0	.0	.0	.0
3	.1	6.6	.0	.0	.0	.0	.0	.0	.0
4	133.2	14042.4	.0	.0	.0	.0	.0	.0	.0
5	.2	28.0	.0	.0	.0	.0	.0	.0	.0
6	.3	39.9	.0	.0	.0	.0	.0	.0	.0
7	.4	50.6	.0	.0	.0	.0	.0	.0	.0
8	.4	23.6	.0	.0	.0	.0	.0	.0	.0

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.95	10.32
2	61.39	9.88
3	195.48	53.92
4	196.28	55.00

*** 2.222 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.88	10.29
2	61.30	9.94
3	195.78	53.85
4	195.86	55.00

*** 2.237 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.11	10.04
2	61.24	9.76
3	195.61	54.04
4	196.10	55.00

*** 2.240 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.01	10.34
2	61.86	9.87
3	195.13	53.95
4	195.80	55.00

*** 2.335 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.77	10.26

2	61.52	9.89
3	195.10	54.23
4	195.34	55.00

*** 2.379 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.86	10.29
2	61.23	9.94
3	195.31	54.21
4	196.07	55.00

*** 2.512 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.18	10.39
2	61.65	10.15
3	195.32	54.20
4	195.73	55.00

*** 2.599 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.81	10.27
2	61.25	9.87
3	195.19	54.06
4	195.96	55.00

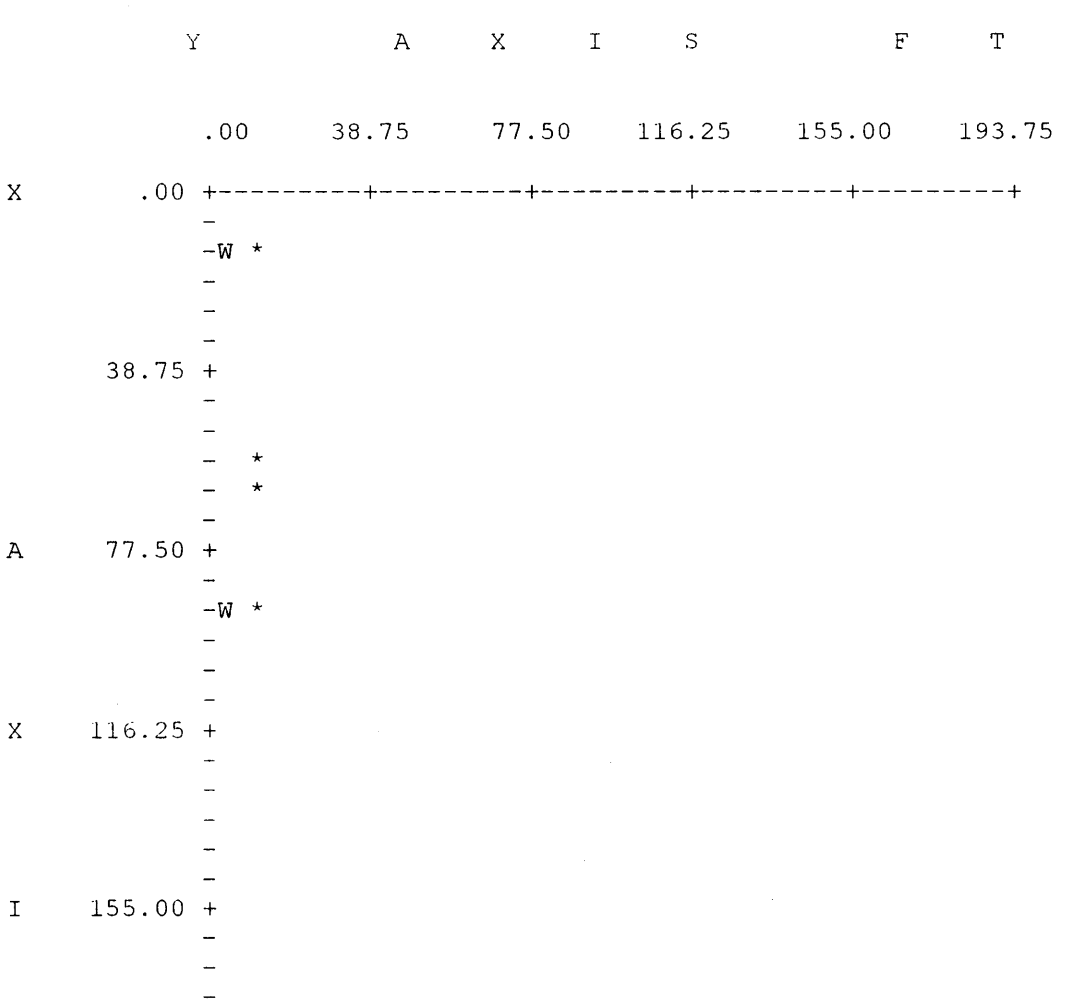
*** 2.608 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.00	10.33
2	61.92	10.20
3	195.45	54.17
4	196.27	55.00

*** 3.015 ***

1



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F     271.25    +
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T     310.00    +           W*    *
```

** PCSTABL5M **

by
Purdue University

1

GCL Seismic

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

F.S. ≈ 1.4

Run Date:	11-14-02
Time of Run:	3:16pm
Run By:	Nigel Miller
Input Data Filename:	D:TAYLOR1E
Output Filename:	D:TAYLOR1E.OUT
Plotted Output Filename:	D:TAYLOR1E.PLT

PROBLEM DESCRIPTION Taylorsville Landfill Cap
6200 South 3200 West

BOUNDARY COORDINATES

3 Top Boundaries
11 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	10.00	10.00	60.00	10.00	1
2	60.00	10.00	195.00	55.00	2
3	195.00	55.00	310.00	55.00	2
4	61.00	10.00	195.00	54.00	3
5	195.00	54.00	310.00	54.00	3
6	61.10	10.00	195.00	53.90	4
7	195.00	53.90	310.00	53.90	4
8	62.10	10.00	195.00	52.90	5
9	195.00	52.90	310.00	52.90	5
10	60.00	10.00	90.00	10.00	1
11	90.00	10.00	310.00	40.00	1

1

ISOTROPIC SOIL PARAMETERS

5 Type(s) of Soil

Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.

Type No.	Unit Wt. (pcf)	Unit Wt. (pcf)	Intercept (psf)	Angle (deg)	Pressure Param.	Constant (psf)	Surface No.
1	110.0	120.0	100.0	25.0	.00	.0	1
2	125.0	130.0	.0	36.0	.00	.0	1
3	120.0	125.0	40.0	33.0	.00	.0	1
4	125.0	130.0	.0	36.0	.00	.0	1
5	115.0	125.0	100.0	25.0	.00	.0	1

1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 3 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	10.00	5.00
2	90.00	5.00
3	310.00	35.00

A Horizontal Earthquake Loading Coefficient
Of .170 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of .000 Has Been Assigned

Cavitation Pressure = .0 psf

1

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

10 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 11.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)

1	61.00	10.00	62.00	10.00	.50
2	195.00	54.00	196.00	54.00	.50

1

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Janbu Method * *

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.43	10.48
2	61.82	10.08
3	195.94	54.14
4	196.38	55.00

*** 1.383 ***

Individual data on the 8 slices

Slice No.	Width Ft(m)	Weight Lbs(kg)	Water Force Top Lbs(kg)	Water Force Bot Lbs(kg)	Tie Force Norm Lbs(kg)	Tie Force Tan Lbs(kg)	Earthquake Force Hor Lbs(kg)	Earthquake Force Ver Lbs(kg)	Surcharge Load Lbs(kg)
1	.3	5.3	.0	.0	.0	.0	.9	.0	.0
2	.0	1.1	.0	.0	.0	.0	.2	.0	.0
3	.1	6.6	.0	.0	.0	.0	1.1	.0	.0
4	133.2	14042.4	.0	.0	.0	.0	2387.2	.0	.0
5	.2	28.0	.0	.0	.0	.0	4.8	.0	.0
6	.3	39.9	.0	.0	.0	.0	6.8	.0	.0
7	.4	50.6	.0	.0	.0	.0	8.6	.0	.0
8	.4	23.6	.0	.0	.0	.0	4.0	.0	.0

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.95	10.32
2	61.39	9.88
3	195.48	53.92
4	196.28	55.00

*** 1.389 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.88	10.29
2	61.30	9.94
3	195.78	53.85
4	195.86	55.00

*** 1.392 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.11	10.04
2	61.24	9.76
3	195.61	54.04
4	196.10	55.00

*** 1.400 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.01	10.34
2	61.86	9.87
3	195.13	53.95
4	195.80	55.00

*** 1.466 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.77	10.26
2	61.52	9.89
3	195.10	54.23
4	195.34	55.00

*** 1.496 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.86	10.29
2	61.23	9.94
3	195.31	54.21
4	196.07	55.00

*** 1.582 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.18	10.39
2	61.65	10.15
3	195.32	54.20
4	195.73	55.00

*** 1.639 ***

1

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	60.81	10.27
2	61.25	9.87
3	195.19	54.06
4	195.96	55.00

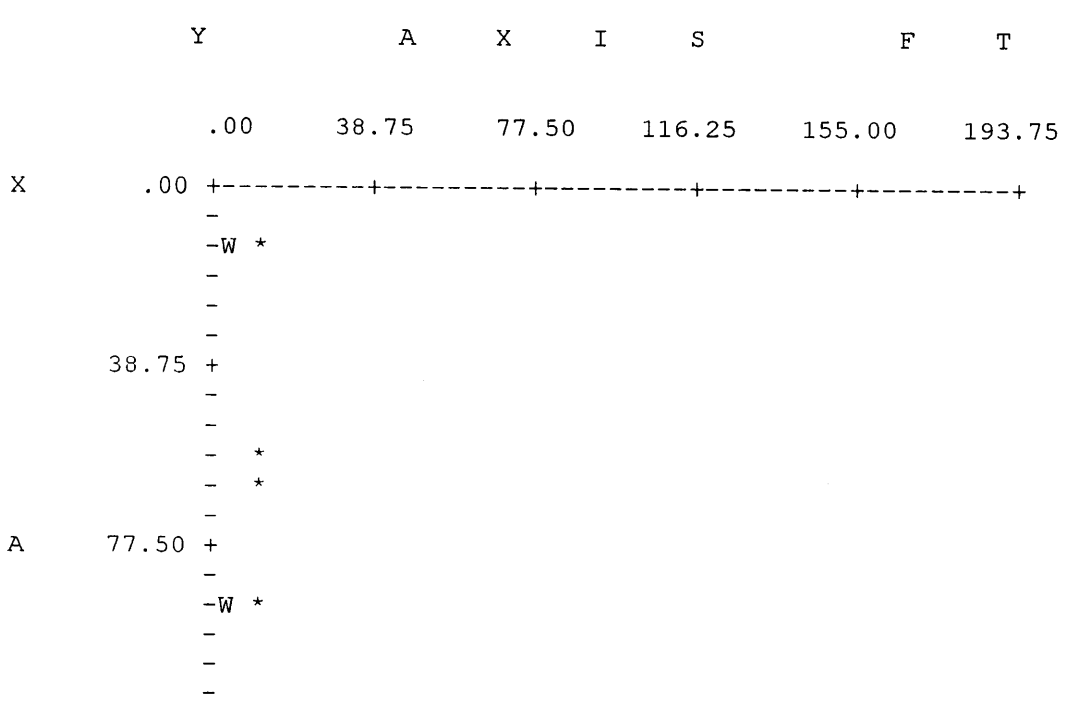
*** 1.648 ***

Failure Surface Specified By 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	61.00	10.33
2	61.92	10.20
3	195.45	54.17
4	196.27	55.00

*** 1.917 ***

1



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X     116.25 +
                -
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                -
                -
I     155.00 +
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                -
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                -
S     193.75 +                  *
                -
                -
                -
                -
                -
      232.50 +
                -
                -
                -
                -
                -
F     271.25 +
                -
                -
                -
                -
                -
T     310.00 +          W*      *
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